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Overview

The Ontario Research Fund Research Excellence (ORF-RE) program promotes research excellence of strategic value to Ontario by supporting new leading-edge, transformative, and internationally significant research.

The ORF-RE focuses on research excellence and strong benefits to Ontario. Applications are reviewed against the following criteria and based on the application stream the proposal is submitted to.

Refer to the section on adjudication criteria in this guide for each of the streams.

- **Research Excellence:** Scientific merit, quality of research
- **Commercialization Potential:** Innovation to be commercialized and market analysis
- **Strategic Value to Ontario:** Anticipated value/impact to Ontario in the following three categories (as relevant to the project):
 - **Commercialization**
 - **Economic Benefits**
 - **Societal Benefits**
- **Plan for Achieving Impact:** Steps that will be taken to achieve the proposed impact
- **Development of Research Talent:** A clear plan for the training of highly qualified personnel
- **Project Management and Governance:** Management of the project, including governance structure, sustainability, budget, and milestones

Purpose of Round

ORF-RE Round 11 consists of two streams as defined in the Definitions section of this guide. Applicants must select one stream for each application submitted.

In this round of the program, the Ministry is prioritizing applications that support Government of Ontario initiatives included in the [2021 Ontario Budget](#) such as [Ontario's First-Ever Critical Minerals Strategy](#) and [Ontario's Vehicle Innovation Network](#).

Applicants are encouraged to review these initiatives for more information.

This includes projects that will support the research and development activities that lead to the commercialization of Made-in-Ontario technologies and solutions for the automotive and mobility sector with a focus on connected, autonomous, electric vehicle (including battery and powertrain technology) and industrial/mining technologies with a focus on the full value-chain, from minerals to manufacturing to recovering resources from vehicles or their component parts at end-of-life.

The two application streams are:

Stream 1: General – Basic and Applied Research

- Open to all research disciplines.
- Priority will be given to applications focused on connected, autonomous, electric vehicle (including battery and powertrain technology) as well as industrial/mining technologies as it relates to electric vehicles, spanning the entire value chain from minerals to manufacturing to recovering resources from vehicles or their component parts at end-of-life.
- Funds projects from \$500,000 to \$2,000,000 (Ontario Portion).
- Funds projects up to a maximum of 5 years.

Stream 2: Targeted – Experimental Research

- Funds projects that demonstrate strong commercialization potential, where the innovation is at a Technology Readiness Level (TRL) of 3 or higher (refer to Appendix B: Technology Readiness Levels Scale).
- Targets projects in research fields that align to areas with Ontario industry receptor capacity. The targeted sectors include:
 - Information Communications Technologies (which will include priority areas of distributed ledger technology, fintech and smart cities /internet of things, artificial intelligence and machine learning);
 - Life Sciences and Medical Devices; and
 - Industrial Technologies (e.g. advanced manufacturing, advanced materials, robotics, 3D Printing, logistics, vehicle manufacturing and critical minerals and related speciality materials).
- Priority will be given to applications focused on connected, autonomous, electric vehicle (including battery and powertrain technology) as well as industrial/mining technologies as it relates to electric vehicles, spanning the entire value chain from minerals to manufacturing to recovering resources from vehicles or their component parts at end-of-life.

- Requires collaboration with an Ontario-based company (refer to Definitions section).
- Funds projects from \$300,000 - \$1,000,000 (Ontario Portion).
- Funds projects up to a maximum of 4 years.

Definitions

Basic research: For the purposes of ORF-RE, this definition is based on the Statistics Canada definition of basic research. Basic research refers to experimental and theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. It includes pure basic research (i.e., experimental and theoretical work undertaken to acquire new knowledge without looking for long term benefits other than the advancement of knowledge) and strategic basic research (experimental and theoretical work undertaken to acquire new knowledge directed into specified broad areas in the expectation of practical discoveries). It provides the broad base of knowledge necessary for the solution of recognized practical problems¹.

Applied research: For the purposes of ORF-RE, this definition is based on the Statistics Canada definition of applied research. Applied research refers to original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. It is undertaken either to determine possible uses for the findings of basic research or to determine new ways of achieving some specific and predetermined objectives².

Commercialization: For the purposes of ORF-RE, this definition is based on the Centres of Excellence for Commercialization and Research Program definition of commercialization. Commercialization is defined as the spectrum of activities needed to turn knowledge and/or technology into new or improved goods, processes or services that result in positive socio-economic, health and environmental impacts³.

Experimental development: For the purposes of ORF-RE, this definition is based on the Statistics Canada definition of experimental development. Experimental development refers to systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products, materials, policies, behaviours or outlooks, or new processes, systems and services or to improving substantially those already produced or processed/installed⁴.

Intellectual Property (IP): Refers to anything that may be protected by any intellectual property right including, but not limited to, works, performances, discoveries, inventions, trademarks (including trade names and service marks), domain names, industrial designs, trade secrets, data, tools, templates, technology (including software in executable code and source code format), Confidential Information as applicable, mask work, integrated circuit topographies, documents, or any other information, data, or materials and any expression thereof⁵.

Industry Liaison Office: These offices support the research endeavors of university and college inventors by facilitating collaborative research with industry partners and disseminating research results through commercialization. Other public institutions, such as hospitals, may also have industry liaison offices.

Contract research: Under a service contract, well-defined work is conducted on a pay-for-service model. A primary goal of a 'service' activity is to apply existing knowledge towards a particular problem or to generate data of limited application. Contract research is not eligible for ORF funding.

Clinical Trials: Refers to a prospective controlled or uncontrolled research study evaluating the effects of one or more health-related interventions assigned to human participants⁶.

Clinical trials cannot be the focus of an ORF project. However, a project may contain a clinical trial element that is a natural extension of the discovery research project and that occurs in latter stages of the project. Determination of eligibility of a clinical trials portion of a discovery research project will be made on a case-by-case basis and final authority on the matter rests with the Ministry.

Ontario-Based Company: Means companies that have the following characteristics:

- (i) pays 50 per cent or more of their wages, salaries or fees to employees or contractors located in Ontario;
- (ii) have the majority of the company's full-time employees located in Ontario; and
- (iii) have the majority of the company's senior officers maintaining their principal residences in Ontario.

Application Process

- Institutions must submit full applications by **5PM on March 21, 2022**.
- See section on Application Submission Requirements.
- Refer to the Application Forms (Stream 1: General and Stream 2: Targeted) and Appendices A and B of these guidelines for instructions related to preparing and submitting an application.

Review Stages

There are four stages of adjudication review.

1) Written Expert Review

The first stage of review is written reviews provided by two experts, who may be located in Canada, or internationally. As much as possible, the Ministry will recruit one expert recommended by the applicant.

No applications are removed from the competition at this stage of review; the written reviews provide input to the next stage of panel review for consideration.

2) Peer Review Panels

The second stage of review is composed of multiple panels based on research discipline. These panels review all aspects of the proposal, with an emphasis on Research Excellence, Commercialization Potential, as relevant, and Strategic Value to Ontario.

In addition, applications must also demonstrate a sufficient Plan for Achieving Impact, Development of Research Talent and Project Management and Governance, as well as demonstrate that the research and development team is able to execute the proposal described and provide an appropriate training environment.

The Ministry reserves the right to choose reviewers and to assign applications to an appropriate panel.

3) Ontario Research Fund Advisory Board

The Ontario Research Fund Advisory Board (ORFAB) reviews the recommendations of the Peer Review Panels and makes a recommendation to the Minister of Colleges and Universities on the portfolio of projects to fund based on the overall impact on Ontario.

4) Minister Decision

The final funding decision rests with the Minister of Colleges and Universities. The Minister may approve applications, approve subject to terms and conditions, or decline applications at his sole discretion.

Decisions are communicated to institutions by letter to the institution's Vice President of Research or equivalent and the lead institutional contact provided on the application form.

The ORF-RE program is a discretionary, non-entitlement program and funding is awarded on a competitive basis. Decisions are final and there is no appeal process, of decisions, and decisions regarding the eligibility of the application.

Funding

The ORF-RE program will fund eligible direct operating costs (including salaries and benefits and limited costs for facilities and equipment, management and administration), as well as a portion of indirect (overhead) costs. The program's 1/3 contribution is inclusive of both direct and indirect cost support.

The program will contribute towards eligible operating costs of an approved research project to a maximum of 1/3 of the total project costs, with 1/3 of the remainder coming from the applicant institution(s) and 1/3 from the private sector (as applicable).

The Ministry may consider a "blended" funding formula in cases where the institution and its private sector partners (i.e. start-up, small-medium sized and multi-national companies), in combination, make up 2/3 of the required funding. This funding flexibility would be provided based on the opportunity for success and the quality of the partnership between the applicants and all partners and should be clearly outlined on the application.

Should the institution and its private sector partners fail to raise the needed 1/3 each or in the case of a blended formula, the required 2/3 of the total project value, the ORF-RE grant may be reduced proportionately. The ORF-RE grant will not exceed the absolute dollar value of the approved amount, even if this ends up being less than 1/3 of the total project value.

Eligibility

Eligible Applicants

Funding is open, on a competitive basis, to the following Ontario institutions:

- publicly assisted universities
- colleges of applied arts and technology
- hospital research institutes
- consortia of the above, with one institution as lead applicant, assuming responsibility and accountability for the consortium

Other Ontario not-for-profit research institutes may apply to the Ministry for eligibility. All decisions regarding eligibility will be made by ORFAB. Institutions seeking eligibility for the ORF-RE Round 11 should contact the Ministry for additional information. In order to allow for sufficient time for the Ministry to process the request, applications for eligibility must be received at the Ministry by **November 15, 2021**.

A not-for-profit research institution seeking eligibility for ORF-RE funding must demonstrate that:

- it is not an agency of the federal government, a provincial government, a territorial government, or a for-profit organization;
- it has capacity to conduct research; and
- it does not receive ongoing operating funding from the province.

If you are a researcher employed at a non-eligible institution and wish to apply, you must hold an academic appointment at an eligible institution and apply through that institution.

Funds contributed by the ORF-RE for approved projects are disbursed to the lead applicant institution. All research supported by ORF funds, including international initiatives, must be conducted in Ontario and expended in Ontario at an eligible institution.

In all instances, funding contributed by the Fund for projects must be directed to the eligible research institution(s) in Ontario and expended in Ontario.

All costs must adhere to the *Broader Public Sector Accountability Act* – 2010, including any procurement directives issued thereunder, to the extent applicable.

Ineligible Applicants

The following organizations will not be considered eligible and cannot apply for, or receive, ORF-RE funding:

- for-profit organizations and agencies of for-profit entities
- federal departments, departmental corporations, parent Crown corporations, or wholly owned subsidiaries of parent Crown corporations
- provincial or territorial departments, agencies, or Crown corporations, as defined in the Government Agency Establishment and Accountability Directive (except for universities, colleges, other educational institutions, or hospitals)
- non-profit corporations that have been established by any of the above

Project Costs

Eligible Direct Cost	Ineligible Projects and Cost
<p>The ORF-RE grant can be used for the following direct costs of conducting research:</p> <ul style="list-style-type: none"> • Salaries and benefits: claimed in proportion to the time spent working on the project • Facilities and equipment: up to 10% of total direct costs • Other direct research costs: including, but not limited to, materials, fieldwork expenses, and dissemination of research. Some hospitality costs may be eligible where essential for networking purposes but must adhere to the <i>Broader Public Sector Accountability Act – 2010</i>. • Technology transfer/commercialization expenses (refer to Project Budget section) • Management and administration: up to 10% of total direct costs • Hospitality costs may be eligible where essential for networking purposes but must adhere to the <i>Broader Public Sector Accountability Act – 2010</i> 	<p>ORF-RE will not accept applications for the following:</p> <ul style="list-style-type: none"> • clinical trials • endowed research chairs or any other endowments • operating, facilities and/or equipment costs related to the operations of national research facilities (SNOLAB, high performance computing platforms, etc.) funded by the Canada Foundation for Innovation’s Major Science Initiatives Fund • contract (fee for service) research <p>Note: specific research projects that utilize national research facilities are eligible to apply to the ORF-RE provided other eligibility criteria are met.</p> <p>In addition, the ORF-RE grant is not to be used for the following:</p> <ul style="list-style-type: none"> • costs related to proposal development • fees for use of equipment owned by the institution unless such fees are charged to all institutional users based on a published schedule • costs related to existing facilities infrastructure improvements, not specifically related to the proposal and/or not included in the original application • opportunity costs • any items or services not directly related to the project • costs associated with litigation • alcohol costs at hospitality events
<p>Eligible Indirect Cost</p> <p>Indirect costs are overhead costs associated with conducting the research project.</p> <p>Applicants can budget up to - but not more than - 40% of direct costs toward indirect costs, in line with the institution's policy on overhead charges. The ORF-RE award is inclusive of both direct and indirect costs.</p>	

Adjudication Criteria – Stream 1: General

Stream 1 applications will be evaluated based on five criteria: Research Excellence, Strategic Value to Ontario, Plan for Achieving Impact, Development of Research Talent, and Project Management and Governance.

1) Research Excellence

- Scientific merit
- Proposed innovation
- Credentials and appropriateness of the research and development team
- Where applicable, degree of inter-institutional and international research and development collaboration

The application should describe what is new and significant about the proposed research and how the project compares with state of the art research in the field locally and internationally as appropriate and, if applicable, within the context of previous Ontario government funding or ongoing Ontario research initiatives.

The application should outline how the research goals, theory and hypothesis contribute to the field from a national and/or international perspective. The applicant should describe unique features of the research environment and how these may contribute to the probability of success.

In addition, the applicant should outline how the proposed research builds on existing research capacity of the institution(s) and describe features of the proposal that enhance research strengths the institution(s) is/are recognized for provincially, nationally or internationally.

If the project being proposed is a continuation of previous ORF-RE funding, detail should be provided about how the new work being proposed is different and/or builds on the previous funding. In the event that the investigator is also working on another project submitted to or currently being funded by the ORF-RE program, indicate the project's name and lead institution and specify the distribution of the investigator's involvement, should all projects be approved for funding.

For proposals that include multiple sub-projects and/or multiple research topics, a plan should be included that describes how they will be integrated and how and why the various parts of the project are relevant and necessary to the project as a whole.

2) Strategic Value to Ontario

- **The examples of each type of value are illustrative, not exhaustive.**
- Anticipated value to Ontario as demonstrated by the applicant in the three categories below. No category is considered more favourably than the others.
- Applicants may address all three categories; however, applicants should emphasize those categories which are most relevant to their project.
- In all cases, impacts may be short- and/or long-term but timeframes for achieving impact should be specifically addressed.
- Applicants should consult their institution's industry liaison office, knowledge mobilization unit, or equivalent as well as their external partners in the completion of this section and demonstrate this engagement where appropriate.
- Applicants are encouraged to document all benefits, particularly to Ontario, associated with their proposal.

Commercialization Benefits includes:

- Commercialization potential
- Ability to produce spin-off products and/or firms
- Likelihood of patent and licensing opportunities
- Knowledge transfer to industry
- Benefits for Ontario pertaining to above
- Market analysis if appropriate (qualitative/quantitative)
- Technology (product or process) that would be developed and how potential customers would use this invention.

Economic Benefits includes:

- Improvements to Ontario's productivity and competitiveness
- Creation of jobs
- Strategic investment in human capital (i.e. development of high-demand transferrable skills)
- Sustainable use of natural resources
- Improving efficiency in private and/or public sector
- Local and regional economic development
- Trade growth
- Enhancement to Ontario's international reputation as an innovation hub
- Expanding access to valuable data assets
- Improvements beyond the private sector partners and beyond traditional IP and commercialization agreements

Societal Benefits includes:

- Improvements to health and well-being of Ontarians
- Improvements to/preservation of environmental quality
- Reducing poverty
- Engagement and mentorship with youth
- Improving public policy
- Effecting a profound shift in the understanding of a given discipline
- Placing Ontario at the forefront of a particular research discipline from an international perspective

3) Plan for Achieving Impact

- A clear and tangible strategy for achieving Research Impacts.
- Engagement of private sector and/or community partners to encourage the adoption of innovative technologies, practices, procedures, and/or policies.
- The extent to which the project will ensure the next-stage recipients or end-users of the research have been and will be engaged (include letters of support as appropriate).
- Next-stage recipients and end-users may include but are not limited to: Firms, Trade associations, Clinicians, Researchers in the scientific community, Non-profit organizations, Community/patient groups, Government and agencies and Inter-institutional partnerships between Universities and Colleges of Applied Arts and Technology.
- Track record of collaboration with next-stage recipients and end-users.
- Strength and commitment of interested recipient partners, demonstrated through financial contributions and/or strong evidence of vested interest in the research outcomes.
- Plan for mitigating potential risks and limitations which may impede the ability to achieve impacts.

4) Development of Research Talent

- Recruitment, retention and training of highly qualified personnel (HQP).
- Meaningful engagement of graduate and post graduate students and post-doctoral fellows.

Briefly outline your plan for strategically investing in the human capital of Ontario through the development of Highly Qualified Personnel (HQP) and use the proposal budget to support it. HQP include undergraduate students, graduate students, and post-doctoral fellows.

The plan should include the total number of HQP you plan on training over the life of the project (consistent with proposed budget and milestones) and the planned learning outcomes for HQP. Identify the expected impact that this training may have on academic research, industry, and/or society and how the meaningful engagement of HQP is integral to the project.

Where possible, include examples of experiential learning, such as thesis/project topics derived from a company problem; soft skills training; first job/internships; entrepreneurship training; collaborative research; and/or co-op placements.

5) Project Management and Governance

- Business plan for the management of the project, including governance structure (i.e. management team, arm's length advisory board, scientific advisory committee, independent academic committee, Board of Directors, with a manager or executive director etc.). A visual of the structure is encouraged.
- Identify the role and function of the project manager and other key project management staff and staff involved in ensuring compliance with contractual obligations with the Ministry.
- Ensure the proposed governance structure is commensurate with the size, scope and complexity of the proposed project.
- Include detail and confirmation that the management of the project will be accountable and will have sufficient authority and independence to ensure that public funds are used appropriately.
- Include a sustainability plan for the research capacity that is created.

Adjudication Criteria – Stream 2: Targeted

Stream 2 applications will be evaluated based on six criteria: Research Excellence, Commercialization Potential, Strategic Value to Ontario, Plan for Achieving Impact, Development of Research Talent, and Project Management and Governance.

1) Research Excellence

- Scientific merit
- Credentials and appropriateness of the research and development team
- Where applicable, degree of inter-institutional and international research collaboration

The application should describe what is new and significant about the proposed research and how the project compares with state of the art research in the field locally and internationally as appropriate and, if applicable, within the context of previous Ontario government funding or ongoing Ontario research initiatives.

The application should outline how the research goals, theory and hypothesis contribute to the field from a national and/or international perspective. The applicant should describe unique features of the research environment and how these may contribute to the probability of success.

In addition, the applicant should outline how the proposed research builds on existing research capacity of the institution(s) and describe features of the proposal that enhance research strengths the institution(s) is/are recognized for provincially, nationally or internationally.

The application should describe the research conducted to date, the knowledge gained from the research, and how the research conducted to date supports the proposed experimental research project. This description should situate the research conducted to date within the context of current advances in the discipline and explain why the knowledge gained is leading edge.

If the project being proposed is a continuation of previous ORF-RE funding, detail should be provided about how the new work being proposed is different and/or builds on the previous funding. In the event that the investigator is also working on another project submitted to or currently being funded by the ORF-RE program, indicate the project's name and lead institution and specify the distribution of the investigator's involvement, should all projects be approved for funding.

For proposals that include multiple sub-projects and/or multiple research topics, a plan should be included that describes how they will be integrated and how and why the various parts of the project are relevant and necessary to the project as a whole.

2) Commercialization Potential

- Proposed Innovation
- Market analysis
- Level of experience and expertise of the research and development team as it relates to the commercialization of the proposed innovation.

The application should outline the following (as relevant to the proposal):

- Describe the proposed innovation. What is the TRL of the innovation and why.
- Outline what is new and significant about the innovation and the unique benefits and value of the innovation to be commercialized.
- How does it compare with existing products/services in the field locally and internationally as appropriate? Provide detail about the relevance of the innovation within the context of previous Ontario government funding or ongoing Ontario research initiatives, if applicable.
- Identify any funding received to date, including any early private-sector investment and/or other funding (i.e. federal, international) to support the proposed innovation, if applicable.
- Describe the unique market opportunity. Describe the target market and demand for this innovation. What industry problem is being solved? Provide any supporting data to help demonstrate the need the innovation and economic potential. What are the expected impacts for the targeted industry sector?
- Provide a description of the primary competitors. Highlight the unique competitive advantages of the proposed innovation versus those of competitors.
- Provide an IP landscape analysis as it relates to your proposed innovation.
- Identify who is involved in assessing, planning, and guiding the commercial and IP aspects of the project. Provide evidence of relevant commercial experience.

3) Strategic Value to Ontario

- **The examples of each type of value are illustrative, not exhaustive.**
- Anticipated value to Ontario as demonstrated by the applicant in the two categories below. Applicants may address both categories; however, applicants should emphasize those categories which are most relevant to their project.
- In all cases, impacts may be short and/or long-term but timeframes for achieving impact should be specifically addressed.
- Applicants should consult their institution's industry liaison office, knowledge mobilization unit, or equivalent as well as their external partners in the completion of this section and demonstrate this engagement where appropriate.
- Applicants are encouraged to document all anticipated benefits, specifically to Ontario, associated with their proposal.

Economic Benefits includes:

- Development and utilization of goods and services in Ontario
- Industrial efficiencies
- Improvements to Ontario's productivity and competitiveness
- Creation of jobs
- Strategic investment in human capital (i.e. development of high-demand transferable skills)
- Sustainable use of natural resources
- Local or regional economic development
- Exports from Ontario/trade growth
- Enhancement to Ontario's international reputation as an innovation hub/ the advancement of Ontario as a global leader in innovation
- Enhancements to Ontario's ability to compete in world markets
- Expanding access to valuable data assets
- Improvements beyond the private sector partners and beyond traditional IP and commercialization agreements

Societal Benefits includes:

- Improvements to health and well-being of Ontarians
- Improvements to/preservation of environmental quality
- Reducing poverty
- Engagement and mentorship with youth
- Improving public policy
- Effecting a profound shift in the understanding of a given discipline
- Placing Ontario at the forefront of a particular research discipline from an international perspective

4) Plan for Achieving Impact

Describe a clear and tangible plan to achieving the proposed impacts as outlined above and as relevant to your proposal and identified TRL.

Commercialization Implementation Plan:

Applicants must work with their industry liaison office or equivalent in the development of the commercialization implementation plan.

- Explain your planned path to commercialization within the 4-year timeframe, including strategy for achieving your commercialization potential and practical application to industry.
- What is your value proposition? Who is going to buy the service or product and why are they going to buy it?
- Outline what research and development needs to occur over the span of the project to move the innovation to a commercially ready product or service.
- Identify any potential research challenges that may impact your timeframe and where you are in that process (e.g. prototyping challenges, regulatory barriers, need for field testing).

- Include a high-level overview of your go-to-market strategy and timeline. Identify any anticipated market roll-out risks.
- Have prospective first customers been secured or engaged? Can you demonstrate their willingness to purchase?
- Quantify key aspects of the proposed business model including price, margin, and volume.
- Indicate strategic alliances, partnerships, or licensing agreements you have or plan to have in place.
- Identify your industry partners, their vested interest in your research and how you plan to work together. Meaningful private sector commitment is demonstrated through financial private sector contribution and/or evidence of vested interest.
- How are industry partners positioned to accelerate commercialization (e.g., end user, channel partner, market validation)?

Commercialization Management Plan including roles and accountability mechanisms:

- Identify the commercialization team.
- Explain the roles of your private sector partners, industry liaison office or other commercially experienced advisors involved in the commercial or IP tracking and actions and outline accountability and reporting mechanisms.

Commercialization Financial Strategy:

- Outline your financial plan for commercializing your research. Briefly describe the necessary financing you will require to fully complete it. If applicable, please list your financial backers/funders and describe how your currently available funding may contribute to the realization of your commercialization plan. Explain the assumptions on which the projections are based on.

Intellectual Property Strategy:

- Explain your proposed IP strategy.
- Explain how your proposed IP strategy will generate benefits to Ontario and Ontarians.
- Explain how your project could improve the value of the IP rights, and enhance current/future patent, copyright, industrial design, integrated circuits topographies and plant breeders' rights protection, as relevant.

5) Development of Research Talent

- Recruitment, retention and training of highly qualified personnel (HQP).
- Meaningful engagement of graduate and postgraduate students and postdoctoral fellows.

Briefly outline your plan for strategically investing in the human capital of Ontario through the development of HQP and use of the proposal budget to support it. HQP include undergraduate students, graduate students, and post-doctoral fellows.

The plan should include the total number of HQP you plan on training over the life of the project (consistent with proposed budget and milestones) and the planned learning outcomes for HQP. Identify the expected impact that this training may have on academic research, industry, and/or society and how the meaningful engagement of HQP is integral to the project.

Where possible, include examples of experiential learning, such as thesis/project topics derived from an industry problem; soft skills training; first job/internships; entrepreneurship training; collaborative research; and/or co-op placements.

6) Project Management and Governance

- Business plan for the management of the project, including governance structure (e.g. management team, arm's length advisory board, scientific advisory committee, independent academic committee, Board of Directors, with a manager or executive director etc.). A visual of the structure is encouraged.
- Identify the role and function of the project manager and other key project management staff and staff involved in ensuring compliance with contractual obligations with the Ministry.
- Ensure the proposed governance structure is commensurate with the size, scope and complexity of the proposed project.
- Include detail and confirmation that the management of the project will be accountable and will have sufficient authority and independence to ensure that public funds are used appropriately.
- Include a sustainability plan for the research capacity that is created.

Other Project Requirements and Considerations

The following requirements apply to Stream 1 and Stream 2 applicants:

Intellectual Property (IP)

The Ministry does not claim any ownership or rights to any IP resulting from ORF-RE funded projects. Such rights are to be determined by the lead institution in accordance with its current IP policy. In cases where a consortium of applicants exists, the policy, as dictated in the Inter-Institutional Agreement (IIA) between the consortium members, will dictate the IP policy.

The applicant should describe how ownership and disposition of IP generated from the project will be determined. The Ministry may request a copy of the institutional and/or relevant IP policy.

Applicants are expected to make mutually agreeable commercialization arrangements with their private sector partners.

Exploitation of Intellectual Property:

Applicants shall use their best efforts to ensure intellectual property created or developed through an ORF-RE funded project is exploited in a way that maximizes benefits for Ontario and Ontarians.

Protection of Intellectual Property:

Applicants must implement the proper mechanisms for the protection of intellectual property in accordance with Ontario and Canadian legislation, if applicable, including without limitation the execution of nondisclosure and confidentiality agreements by personnel that are directly involved in the Project.

IP Resources

The Ministry recognizes the important contribution you are making to your field of practice, as well as the potential commercial value that your ideas hold. Strengthening the ways that Ontarians use intellectual property to support the provincial and local economies is a key priority for our government.

In July 2020, the Ontario government announced the province's first [Intellectual Property Action Plan](#), following the recommendations made by the [Expert Panel on Intellectual Property](#).

The IP Action Plan will drive the province's long-term economic competitiveness by prioritizing the generation, protection, and commercialization of IP. We encourage you to familiarize yourself with [Ontario's intellectual property resources](#), as well as those available through the [Canadian Intellectual Property Office \(CIPO\)](#).

Youth Engagement and Outreach

Successful applicants will be required to connect youth with researchers and may use up to 1% of the ORF-RE grant to undertake annual youth science and technology outreach activities directly pertaining to the ORF-funded research project. The primary target audience is elementary and high school students, as they are most receptive to in-depth mentorship experiences.

Researchers can:

- engage youth audiences as well as educators and the general public both on-campus and in the local community
- expand on current outreach activities, or start new initiatives with an emphasis on activities that are free to youth and the public
- partner with other researchers in their institution(s) to undertake a broader outreach initiative
- participate in outreach activities operated by other organizations, such as science awareness organizations
- involve graduate students in outreach program design and delivery
- apply provincial contributions to expenses incurred in developing and delivering the outreach activity, e.g. consumable supplies, development of working models, mileage
- Outreach activities can also include speaking opportunities, lecture series, workshops and demonstrations, student competitions and lab mentorship

Collaborating Institution(s)

If applicable, name other institution(s) that will be collaborating on the project. If approved for an award, multi-institutional projects must have an Inter-Institutional Agreement (IIA) in place as soon as practically possible.

The IIA must identify and address:

- The lead institution

- Governance structure
- Intellectual Property (IP) ownership and disposition
- Control and ownership of research equipment
- Financial arrangements, including allocations of contributions, expenditures, and indirect costs

Researchers' Interest in Private Sector Partners

All researchers are required to fully declare any interest they have in any of the private sector partners named in the proposal. In some cases, there may be less than arm's length relationships among certain private sector partners, institutions and researchers participating in the project (e.g. where the researcher is a part owner).

Such relationships will be reviewed on a case-by-case basis and may be acceptable, provided the partner:

- has its own physical facilities, separate from that of the researcher;
- employs its own technical staff; and
- is under the management of someone other than the researcher.

Where such relationships arise, they must be fully disclosed to the Ministry in the application.

The applicant must provide all information on the degree of ownership of researchers involved in the project and their role in the private sector company to ensure that the commercial activity is consistent with the lead institution's established policies on disclosures of commercial interests, as well as with its conflict of interest guidelines. The lead institution may be required to confirm this capability at the time of contract negotiation against criteria determined by the Ministry.

Equity, Diversity and Inclusion

The Ministry is committed to making equity, diversity and inclusion (EDI) a priority through the integration of EDI principles into ORF-RE funding opportunities.

The Tri-Agency Institutional Programs Secretariat (TIPS), through the Social Sciences and Humanities Research Council (SSHRC), defines equity as the removal of systemic barriers and biases, to enact the practice of inclusion so that all individuals have equal access to and can benefit from the program.

To achieve this, TIPS states that institutions must embrace diversity, defined as differences in race, colour, place of origin, religion, immigrant and newcomer status, ethnic origin, ability, sex, sexual orientation, gender identity, gender expression, and age. Recognizing and valuing diversity and equity must be accompanied by concerted efforts to ensure the inclusion of diverse and underrepresented populations.

The research project should meaningfully engage members of underrepresented groups within the research and development team. Underrepresented groups include, but are not limited to, the four designated groups (women, Indigenous peoples, members of visible minorities, and persons with disabilities). The institution must strive to put in place the right conditions for each individual to reach their full potential.

Please use the [Equity, diversity and inclusion requirements and practices guide](#) provided by TIPS to determine how best to address areas of improvement in your work environment and to develop equity, diversity and inclusion action plans⁷.

Milestones and Deliverables

Using simple, non-technical language, list major milestones, the significance of these milestones (where appropriate) and the expected project funding year of completion.

Milestones will be used to monitor and determine the project's progress against a specific project work plan for the duration of the project.

A milestone is defined as a significant expected event or accomplishment in the life of the project resulting from research activities or a point at which an important change or resolution occurs. Please use brief and succinct statements when describing the justification for the milestone. This may not apply to all milestones. Areas of significance to consider when building milestones include:

- Significance in advancing the science, discipline or current state of knowledge in the field of study.
- Significance to the institution's research capacity building. Will it attract, train and retain highly qualified personnel?
- Significance to the private sector partners on the project. Particularly, the significance to the Ontario-based company(s) collaborating in the project, as relevant and applicable to the project and application stream.

- Significance to Ontario. Will it create jobs? Will it brand Ontario as a leading jurisdiction for conducting research in the discipline/focus/area? Will it improve quality of life for Ontarians? How else will it affect the economy and society of Ontario?

In projects that have sub-projects, list milestones in chronological order under their respective sub-project. Where appropriate, a brief statement should be included which justifies the milestone in terms of the overall research project.

Project Budget

It is essential that applicants provide their best forecast of project expenditures and contributions in the budget template. Applicants should pay particular attention to whether their timelines are realistic. The decision to allow a grant extension will be viewed in the context of the Ministry's fiscal plan, and will be reviewed on a case by case basis. Projects should not assume that extensions will be granted.

Please also note that the 'amount requested from ORF-RE' is not necessarily the amount that will be received in that year. Projects will be subject to a final holdback amount and the actual payment will be determined based upon actual project revenue and expenses submitted through the Request for Payment process.

Annual Budget Tables

Applicants are required to provide a zero-based budget that details all expenses and revenue sources that will support the operating needs of the proposed project. All 'Totals' will be calculated automatically in the budget table.

Expenses

Please provide the amount for each category of eligible expenses that is anticipated in each year of the project. The ORF-RE grant can be used for the following eligible direct costs:

Personnel

In all cases, salary and benefit expenses can only be claimed in proportion to the time spent working on the project.

Personnel costs can include salaries, stipends and related non-discretionary benefits of researchers, technical staff and management and administrative staff and assistantships for students.

The cost of release time for teaching duties may be eligible if the applicant can demonstrate the need for this cost to complete the project and supported by a letter from the host institution. The total eligible amount will be approved on a case-by-case basis at the sole discretion of the Ministry.

The ORF-RE funding can be used to cover up to \$20,000 for graduate student research assistants (MSc and PhDs) and \$50,000 for postdoctoral fellows (PDF). Institutions may top up the stipends extended to students and postdoctoral fellows at their discretion using other project funds.

Facilities and Equipment

Up to a maximum of 10% of total direct costs may be allocated to facilities and equipment that is critically and explicitly needed to carry out the project and can include:

- Research equipment - Supplies, computer and communication equipment as well as software required for the research, including costs of purchase, refurbishment, transportation, extended warranties, importation costs, staff training for use, maintenance and operating costs (not including indirect costs such as power, insurance, etc.)
- Cost of renovations and alterations of existing space where essential for the research
- Leased space - Or institutional contributions of space when that space is newly developed, renovated, refurbished or leased
- Costs related to new or additional digital research infrastructure resources (e.g. capacity or throughput computing, high performance storage, computing using specialized accelerators including GP-CPU and others, etc.), in excess of \$99,999, should not duplicate Compute Ontario's coordinated digital research infrastructure resources. Applicants will be required to confirm they have consulted with Compute Ontario at the time of contracting to ensure there is no duplication and that the new or additional digital research infrastructure resources are housed, managed and operated in a way to maximize their use.

Other Direct Research Expenses

Other direct research expenses can include, but are not limited to:

- Commercially-available consumable supplies, reagents, etc.
- Costs for dissemination of research results

- Costs related to ensuring open access of research results
- Costs of holding a workshop or seminar, including hospitality costs of networking purposes for research related activities (note: Alcohol is not an eligible ORF expense under any circumstance)
- Consulting services provided by any individual unrelated to any of the project partners and subcontracted to provide service or knowledge of a highly specialized nature for up to one quarter per fiscal year. They must be essential to the research and demonstrate they save the project time and money. Their fees should reflect reasonable market rates
- Honoraria for guest lecturers
- Safety related expenses for field work, including immunizations, protective gear, etc.
- Reasonable out-of-pocket expenses for fieldwork, conferences, and collaborative trips
- Reasonable travel costs to visit collaborating universities/colleges or business partners for the purpose of the project (amount may be limited at the discretion of the Ministry)
- Air travel costs - not to exceed full economy fares (amount may be limited at the discretion of the Ministry)

Technology Transfer/Commercialization Expenses

To support applicants' efforts to ensure intellectual property created through ORF-RE funded projects are exploited in a way that maximizes benefits for Ontario and Ontarians, the following expenses can be included:

- Consulting fees to develop the intellectual property strategy/business plan to protect the technology's commercial value
- Market investigations, validation, studies, assessments, survey, etc.
- Business development/mentoring
- Intellectual property protection/management (e.g. patenting expenses, registration, filing costs, business case development, technology evaluation)
- Technology/product testing, validation or prototype development
- Expenses associated with creating a partnership with potential receptor companies/investors (such as reasonable travel costs, etc.)
- Legal services (except for litigation costs)
- Knowledge dissemination activities
- Other costs required to support translation/commercialization activities

Management and Administration

Management and administration costs may account for up to 10% of total direct costs and can include:

- Salaries and benefits of management staff/personnel directly involved with the project
- Management and administration costs, including reasonable justifiable office supplies (amount may be limited at the discretion of the Ministry)
- Other costs, which can include items such as external financial audits of the project as defined in the grant agreement

Contribution Summary

The ORF-RE program will fund eligible direct operating costs, as well as a portion of indirect (overhead) costs. Up to an additional 40% of direct costs may be included as indirect costs. The program's 1/3 contribution is inclusive of both direct and indirect cost contributions. The maximum amount of the ORF grant that can be applied to indirect cost is 40% of the portion of the grant applied to direct costs.

As such, on a \$1M grant, the institution can take a maximum of \$285,714 from the grant toward indirect costs ($\$1,000,000/1.4 \times 0.4 = \$285,714$).

Eligible contributions and expenditures

Contributions, both in-kind and cash, are eligible if received (but not spent) up to one year before the application due date. Since the application due date for this round is **March 21, 2022**, contributions secured after **March 21, 2021** (but not spent) are eligible. Expenditures are only eligible after the project starts. The earliest a project can start is **September 28, 2021** which is the date the current round was announced.

Institutional Contributions Summary

Applicants must be prepared to disclose the sources of their institutional contributions, which can include:

- Federal granting council (Canadian Institutes of Health Research [CIHR], Natural Sciences and Engineering Research Council [NSERC] and Social Sciences and Humanities Research Council [SSHRC]) awards directed to researchers of the institution where the funded research is a component of the overall ORF-funded project. The industry portion of an NSERC CRD and an NSERC Industrial Research Chair will be considered as an eligible private sector contribution.
- The non-infrastructure portion of a Canada Research Chair award to an institution if the Chair is working on the project.
- Any research funding, philanthropic gift, or grants and gifts directed in general to the research institution and earmarked by the institution to an ORF-RE project or directed to the project itself.

Note: grants received for a specific purpose from the Ontario government or from an Ontario government agency, or funding which has already fully leveraged Ontario government funding, cannot be used as an institutional contribution toward the project.

Private Sector Partner Contributions Summary

Applicants are required to disclose all revenue sources for their project, including all private sector contributions. All letters of support should be a maximum of one (1) page in length.

- Private Sector Cash Contributions - Cash contributions must be fully detailed in the letter of support from the Private Sector Partner (PSP).
- Private Sector In-Kind Contributions - In-kind contributions need to be crucial to the project (i.e. if not contributed by the private sector, the institution would need to acquire the resources with institutional cash) and can include equipment or related warranties, materials and expendable supplies, software and databases/datasets, use of space or facilities, salaries (including benefits) of professional, technical, analytical, or project-specific administrative personnel and access to unique databases, high performance computing services and travel costs (may be limited) for essential time limited off-site work related to the project. When a private sector partner provides personnel with specialized knowledge or skills, ORF-RE will regard this as an in-kind contribution to be valued at that personnel's salary and benefit level in proportion to the time spent on the project. Such personnel will not be considered consultants.
- Private Sector in-kind contributions must be detailed in the appropriate letter of support. These must describe how the value of the contribution was determined (e.g. pro-rated salary, best customer price, academic discount, published prices, etc.).
- These values must correspond with the values described in the budget breakdown and private sector partner tabs.

Private Sector Partner Contribution Details

Ensure that each partner and associated contribution is supported by a corresponding letter of support and that the totals correspond to the amount declared in the Contributions Summary. The private sector letters of support should be included as an attachment as instructed in the application.

Private Sector Partner(s)

For the purposes of assessment, private sector partners can include:

- For-profit businesses
- Business organizations and/or not-for-profit research institutes funded primarily by relevant businesses

While all private sector partners do not need to be located in Ontario, the lead institution must demonstrate that the project will make a positive impact on Ontario's research and commercialization capabilities. International partners are eligible however, the applicant must demonstrate how their involvement benefits Ontario.

In assessing the strength of the private sector commitment, researcher-owned sole proprietorships are not considered eligible private sector partners on a project in which the researcher is a named investigator or collaborator.

Contributions from charities, foundations and private philanthropists cannot be used as part of the private sector contribution but may be included as institutional contributions.

Stream 2 Applications: Additional Private Sector Partners Requirements

Applicants to Stream 2 must demonstrate collaboration with at least one Ontario-based company (see Letters of Support requirements).

Private sector partners should demonstrate that they have the financial, managerial, and strategic business capability to exploit research results.

ORF Request

Note that this amount will be automatically calculated as the difference between the total project expenses and the contributions from other sources detailed in the contribution summary.

Budget Justification

The application should include a high level justification for the amount requested in each expense category.

For the purposes of the application, outline the total costs in each category, the number of people and the percentage of their time that will be dedicated to the project. Please ensure you follow program guidelines in terms of limits related to salary expenditures etc.

Expert Reviewers

Recommended External Expert Reviews

The suggested experts should not have a conflict of interest (CoI) with the proposal or the PI. It is recommended that you speak to potential reviewers listed on your application and alert them to the fact that they may be contacted to review your application. **Do not** provide more than two names in this section. A maximum of one out of the requisite two expert reviews will be obtained from a reviewer recommended by the applicant.

Note: the Ministry reserves the right to choose reviewers and will choose an additional reviewer to bring the total reviews to two. While the Ministry will attempt to obtain a minimum of two reviewers, there may be situations where this is not possible.

Excluded Expert Reviewers

In this section, if desired, you may also provide up to **five** names of experts you do not want selected as reviewers. This section will be shared with members of ORFAB, the Review Panels, external expert reviewers and others for the purposes of adjudication and administration of the ORF-RE program.

Attachments

Letters of Support

All letters should be a maximum of one (1) page in length including Institutional Letters, Private Sector Partners Letters and End User letters of support.

Institutional Letters of Support

Each application must be accompanied by a Letter of Support (LoS) from the lead institution, indicating whether the goals of the proposed research are consistent with the institution's overarching research strategy. The letter must be signed by the Vice-President of Research or any other officer of the institution with authority to bind the institution. In the case of applications involving more than one institution, a letter of support should also be included from each collaborating institution, signed by the Vice-President Research or any other office of the institution with authority to bind the institution. All institutional letters of support should be compiled into a single pdf file with a cover page listing the documents contained within. The file should be named according to the following convention: **Institution Name_PI Last Name_Ins LoS**.

Private Sector Partner (PSP) Letters of Support

All PSP letters of support should clearly articulate the amount being committed, the timeframe of the commitment and for in-kind support, how the value was determined. PSP letters should be compiled into a single pdf file with a cover page listing the letters contained within. The file should be named: **Institution_PI Last Name_PSP LoS**. Please note that, for projects successfully funded, the Ministry reserves the right to request a revised letter of support from a PSP during the contract negotiations.

End User Letters of Support

Include appropriate Letters of Support as a single pdf file with a cover page listing the letters contained within. The file should be named: **Lead Institution_PI Last Name_User LoS**.

Stream 2 Applications: Additional Letters of Support Requirements

Applicants to Stream 2 must submit the following additional letters, in addition to the letters described above (Institutional, Private sector partners, End Users) as attachments to the application. The file should be named: **Lead Institution_PI Last**

Name_Stream2_LoS

1. Ontario-based company: Letter(s) of support from a minimum of one Ontario-based company (refer to the Definitions section), detailing involvement in the project, partnership details, strength of commitment to the project outcomes. The letter should clearly outline how the company(s) benefit from the collaboration.
2. Industry Liaison Office: Letter of support from the applicant institution's Industry Liaison Office or equivalent. The letter of support should clearly outline how the industry liaison office intends to support implementation of the commercialization plan.
3. Industry partners: Letter(s) of support from interested industry partners demonstrated through financial contributions and/or evidence of the private sector's vested interest in the research. The letter(s) should clearly outline how the industry benefits from the collaboration.

Curriculum Vitae (CV) of Named Investigators and Key Project Staff

For investigators or key project staff, please attach a CV (**maximum 2 pages per CV**) to the application, highlighting his/her recent contributions to research and capacity-building, for example:

- Other research support currently held or applied for
- Training of highly qualified personnel (e.g. training of undergraduate students and technical/professional assistants).
- Other significant achievements (e.g. peer-reviewed publications, patents, significant presentations, awards, honours, membership on committees etc.).

All CVs should be compiled into a single pdf file with a cover page listing the CVs contained within and named:

Lead Institution_PI Last Name_CVs

Grant Agreement

When funding for a proposal is approved, the successful applicant institution will sign a grant agreement (contract) with the Ministry. The "Start-date" for the project is generally the date of the Award Notification Letter or later. The Ministry may negotiate an earlier "Start-date" which will not be any earlier than the date of the call for proposals for that round of competition. For ORF-RE Round 11, this date is **September 28, 2021**.

The agreement will address terms and conditions for the disbursement of the grant funds that could include, but are not limited to, the following:

- milestones, deliverables and performance measures
- project budget
- project management
- mode and schedule of payments
- accountability framework
- IP ownership and disposition
- communications strategies
- contract termination clauses
- monitoring and reporting requirements, including annual progress reporting, financial audits and Request for Disbursement and other reports as stipulated

The Ministry will monitor the project in relation to:

- governance
- timely submission of annual progress reports, including success stories
- project milestones, deliverables and performance measures
- cash flow and accuracy of cash flow forecasting
- financial reporting and audits
- youth outreach

- IP arrangements
- other requirements as set out in the contract

The Ministry, at its discretion and upon reasonable notice, reserves the right to undertake periodic site visits and scientific reviews of projects.

This program may be subject to change. Grant disbursements are subject to the Ministry having an appropriation approved by the Legislative Assembly of Ontario for the fiscal year in which the disbursement is to be made.

Application Submission Requirements

Submitting Application

Submit the three files as outlined below via your organization's preferred secure cloud storage solution (File Transfer Protocol (FTP), drop box, google drive, etc.). You are responsible for ensuring Ministry access to the preferred solution. Ministry staff will access the storage drive and confirm access has been granted.

The link should be sent to ORF.Excellence@ontario.ca no later than **5PM on March 21, 2022**. Late or incomplete applications will not be accepted.

1. a completed electronic application (using the Ministry's application form) including all attachments.
2. a single PDF with all the application materials and all attachments.
3. a PDF copy of the signature page signed by the Vice-President of Research or any other officer of the institution with the authority to bind the institution, if the institution is unable to provide an e-signature.

Electronic Application Requirements

- On the application cover letter list the application(s) submitted, title of the project(s) and the name of the Principal Investigator(s).
- The application(s) should be signed by the Vice-President of Research or any other officer of the institutions with the authority to bind the institution.
- Electronic attachments should be clearly named in the following format: Institution Name_Pi Last Name_AttachmentType.
- All documents of a single type (e.g. curriculum vitae (CV)s, letters of support, etc.) should be combined into a single file with a cover page listing the contents.
- Any scanned PDF documents should be done at a lower resolution to reduce the size of the file.

Preparing Application

- Use font Arial 11 if you copy and paste text into the application form.
- Adhere to the restrictions on page numbers provided for in each of the sections of the Application Forms as outlined below. Failure to follow formatting instructions, including page number restrictions may result in the application being deemed ineligible and removed from the competition.
- Avoid technical jargon in abstracts and milestones.

Application Form Page Limits

Sections of Application Stream 1 and 2	Page Number Limits
General Information	No page limits
Research Excellence Commercialization Potential Strategic Value to Ontario Plan for Achieving Impact Development of Research Talent Project Management and Governance Other Project Requirements Milestones and Deliverables	30 pages The Ministry defers to the applicant to use this space effectively
Project Budget	No page limits
References - within the Research Excellence section (not part of the 30-page limit above)	3 pages
Figures – within the Research Excellence section (not part of the 30-page limit above)	10 pages
Expert Reviewers	No page limits
Attachments: Letters of Support (1 page each) and CVs (2 pages each) of investigators and key project staff. Publications included in CV should be restricted to the last five years only.	20 pages
Mitigating Economic and Geopolitical Risk Checklist	4 pages
Confirmations	No page limits
Signatures	No page limits

Communications

- To ensure continuity, consistency and open communication between the applicant and the program, all inquiries/discussions during the application, review and post-award processes are to be coordinated by the lead institution's named contact on the application and Ministry staff.
- Applicants needing additional information or clarification regarding their application to ORF-RE may reach the ministry at: ORF.Excellence@ontario.ca

Common Application Errors and Weaknesses

Common weaknesses of applications identified in previous ORF rounds include:

- failure to meet research excellence criterion
- failure to indicate how the proposal relates to or differs from the current state of the art research in the field, within the Ontario context as well as nationally and internationally
- failure to indicate how the proposed research differs from research previously funded by the Ontario government
- proposed research lacks focus (numerous, unrelated or loosely related projects)
- failure to “make the case”, i.e. to explain the steps that led to the proposed research concept
- failure to demonstrate the impact of the research
- ‘overselling’ of research impact (eg. inflated market values do not convince panels, rather they demonstrate the applicants’ lack of understanding of the true market)
- failure to clearly explain the steps that will be taken to maximize the likelihood of achieving the research impacts
- failure to clearly engage next-stage recipients and end-users of research
- proposed research is not ground-breaking or innovative (e.g. small scale, single experiment focused)
- the budget appears inflated and/or expenses are not adequately justified
- the management structure is poorly defined

- the governance structure lacks autonomy
- sustainability is questionable beyond government funding
- failure to demonstrate commitment and relevance of industry partners

Ethical, Safety and Integrity Requirement

Institutions must undertake the responsibility to ensure any experimentation will be acceptable on ethical and safety grounds.

- Research involving human subjects or human stem cells must comply with the [Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS 2 \(2018\)](#)
- In the case of laboratory animal experimentation, the institution must comply with the [guidelines and policies of the Canadian Council on Animal Care](#).
- Institutions must ensure that any research involving databases containing personal information adheres to ethical and legal requirements relating to privacy, confidentiality and security of the database information.
- Any research involving biohazards must adhere to the standards outlined in the [Public Health Agency of Canada’s Laboratory biosafety guidelines](#).
- Research involving radioactive materials must comply with [Canadian Nuclear Safety Commission regulations](#).
- Institutions must ensure compliance with the [Tri-Agency Open Access Policy on Publications](#).

The Ministry expects researchers and participating research institutions to maintain the highest standards of research integrity. Research institutions are expected to have and abide by policies and procedures that govern research integrity.

Security Requirements

- The Ministry may undertake a review of proposals submitted to the competition to assess potential economic and/or geopolitical risks associated with the project. Results of this review may be shared with members of the review panels and others involved in the adjudication process and may impact funding decisions.
- Institutions should assess proposals submitted for funding for potential economic and/or geopolitical risks using existing institutional resources, policies and processes to help researchers identify and manage economic and geopolitical risks. In addition, consider any potential controversy or negative views that may result from any existing or planned association with all partners, including, private sector partners that may ultimately impact the reputation of Ontario.
- Further considerations when assessing potential economic and/or geopolitical risks:
 - Could the results of your research be used to support activities in other countries with ethical standards different from Ontario e.g. such as, internal surveillance and repression?
 - Are there any dual-use (both military and non-military) applications to the research being undertaken?
 - Is any of the research likely to be subject to Canadian or other countries’ export license controls, particularly Ontario’s closest trading partners and allies?
- Applicants will be required to complete a Mitigating Economic and Geopolitical Risk Checklist as part of the application.
- Additional resources:
 - [Mitigating economic and/or geopolitical risks in sensitive research projects. A tool for university researchers. December 2019.](#)
 - [Geopolitical risk matrix assessment, partnership and best practices checklists developed by the U15.](#)
 - [Safeguarding Your Research Checklist](#)

Ownership and Control of Research Equipment

Ownership and control of research equipment related to a funded ORF-RE project must remain with the institution for a period of five (5) years after acquisition and/or installation. In the case of a project with a multi-institutional composition or consortium, the IIA should dictate the arrangements made with regard to the ownership, control and disposal of research equipment.

Research equipment must be located at an eligible research institution(s), or outside an eligible research institution when it can be shown that this is the most effective placement of the equipment. Any change in location requires notification in writing to the Ministry and may require the Ministry approval.

Freedom of Information and Protection of Privacy Act (FIPPA)

The Ministry is subject to the [Freedom of Information and Protection of Privacy Act](#), R.S.O. 1990 c. F.31, as amended (“FIPPA”). Any information provided to the Ministry in connection with an application to the Ontario Research Fund Program may be subject to disclosure in accordance with the requirements of that Act.

When submitting an application, applicants may wish to consider clearly labelling or otherwise identifying any information being provided to the Ministry under this application that in their view may be considered confidential, commercially sensitive or proprietary information with reference to section 17 of FIPPA.

Applicants are asked not to provide any unsolicited personal information when completing the application form.

Information and documentation provided to the Ministry in the application may be shared with members of ORFAB, Ontario Review Panels, external expert reviewers and others for the purposes of administering the ORF-RE program.

Contact Information

If you have questions about the ORF-RE contact: ORF.Excellence@ontario.ca

Appendix A: Canadian Research and Development Classification (CRDC)

The Ministry has implemented the Canadian Research and Development Classification (CRDC), a system that provides a common approach to classifying research across institutions and governments. It was published by Statistics Canada on October 5, 2020⁸.

The CRDC was developed through a collaborative effort by the Canada Foundation for Innovation (CFI), the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council of Canada (SSHRC) and Statistics Canada.

The CRDC includes all current sectors of research in Canada and supports a wide range of needs within the research and development ecosystem. It is modelled after the Australian and New Zealand Standard Research Classification and Frascati Model 2015 (from the Organization for Economic Cooperation and Development) and aligns with international standards.

The three classifications in the Canadian Research and Development Classification (CRDC) are:

1. Type of Activity (TOA);
2. Fields of Research (FOR); and
3. Socio-economic Objective (SEO).

When completing your application form, please refer to the CRDC guidelines and classification codes, available for download in HTML, CSV, and PDF formats:

- English: <https://www.statcan.gc.ca/eng/subjects/standard/crdc/2020v1/index>
- French: <https://www.statcan.gc.ca/fra/sujets/norme/ccrd/2020v1/indice>

Guidelines for classifying with the CRDC

1. Classifying by type of activity (TOA)

This way of classifying research refers to whether it is basic research, applied research or experimental development.

- The research project should be allocated to a single TOR (basic research, applied research or experimental development). TOA Codes can be found online using the links noted above. You must provide the alphanumeric code as well as the title/name of the TOA in the fields provide on the application form.

Example:

Code: RDT2 Division: Applied research

2. Classifying by field of research (FOR)

This way of classifying research includes major classes and related subclasses of research based on disciplines, knowledge sources, objects of interest, methods, processes, and techniques used in research and development activity. This is different from socioeconomic objectives, which refer to the purpose or outcome of the research and development activity.

- The research project should be allocated to a single FOR (major class and related subclass). FOR Codes can be found online using the links noted above.
- You must provide the alphanumeric code as well as the title/name of the FOR in the fields provide on the application form.

Example:

Level 1 Code: RDF10 Division: Natural Sciences

Level 2 Code: RDF104 Group: Chemical sciences

Level 3 Code: RDF10404 Class: Macromolecular and materials chemistry

Level 4 Code (optional): RDF1040401 Subclass (Field): Characterization of materials

3. Classifying by socioeconomic objective (SEO)

This way of classifying research refers to the intended purpose or outcome of the research and development activity. This is different from fields of research, which refer to the disciplines, knowledge sources, objects of interest, methods, processes, and techniques used in the research and development activity in order to achieve objectives.

- The research project should be allocated to a single SEO (major class and related subclass). SEO Codes can be found online using the links noted above.
- You must provide the alphanumeric code as well as the title/name of the SEO in the fields provide on the application form.

Example:

Level 1 Code: RDS109 Division: Education

Level 2 Code: RDS10901 Group: Stages of education

Appendix B: Technology Readiness Levels Scale

Stream 2 Applicants must demonstrate a TRL 3 or higher.

For the purposes of ORF-RE, technology readiness level is defined by Innovation Canada⁹.

Level 1: Basic principles of concept are observed and reported

- Scientific research begins to be translated into applied research and development. Activities might include paper studies of a technology's basic properties.

Level 2: Technology concept and/or application formulated

- Invention begins. Once basic principles are observed, practical applications can be invented. Activities are limited to analytic studies.

Level 3: Analytical and experimental critical function and/or proof of concept

- Active research and development is initiated. This includes analytical studies and/or laboratory studies. Activities might include components that are not yet integrated or representative.

Level 4: Component and/or validation in a laboratory environment

- Basic technological components are integrated to establish that they will work together. Activities include integration of "ad hoc" hardware in the laboratory.

Level 5: Component and/or validation in a simulated environment

- The basic technological components are integrated for testing in a simulated environment. Activities include laboratory integration of components.

Level 6: System/subsystem model or prototype demonstration in a simulated environment

- A model or prototype that represents a near desired configuration. Activities include testing in a simulated operational environment or laboratory.

Level 7: Prototype ready for demonstration in an appropriate operational environment

- Prototype at planned operational level and is ready for demonstration in an operational environment. Activities include prototype field testing.

Level 8: Actual technology completed and qualified through tests and demonstrations

- Technology has been proven to work in its final form and under expected conditions. Activities include developmental testing and evaluation of whether it will meet operational requirements.

Level 9: Actual technology proven through successful deployment in an operational setting

- Actual application of the technology in its final form and under real-life conditions, such as those encountered in operational tests and evaluations. Activities include using the innovation under operational conditions.

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1. https://www.statcan.gc.ca/eng/subjects/standard/crdc/2020v1/introduction#_Classifying_by_TOA
 2. Same as above
 3. Centres of Excellence for Commercialization and Research (CECR) (nce-rce.gc.ca)
 4. Same as above
 5. <https://www.ontario.ca/document/report-intellectual-property-in-ontarios-innovation-ecosystem>
 6. <https://cihr-irsc.gc.ca/e/34190.html#c>
 7. Tri-Agency Institutional Programs Secretariat (TIPS)
 8. Source: <https://www.innovation.ca/about/news/cfi-has-implemented-new-canadian-standard-classifying-research>
 9. [Technology readiness levels - Innovation Canada \(ic.gc.ca\)](https://www.innovation.ca/about/news/cfi-has-implemented-new-canadian-standard-classifying-research)